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UNITED STATES DEPARTMENT OF AGRICULTURE

BULLETIN No. 302

Contribution from the Office of Markets and Rural Organization
CHARLES J. BRAND, Chief

Washington, D. C. ▼ September 15, 1915

APPLE MARKET INVESTIGATIONS 1914-15

By

CLARENCE W. MOOMAW, Specialist in Cooperative Organization,
and
M. M. STEWART, Assistant in Market Grades and Standards

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INTRODUCTION.

During the season of 1914–15 the Office of Markets and Rural Organization studied certain phases of apple marketing and distribution. This work began with an investigation of commercial apple crop conditions, and when the marketing season opened in September investigations were made in the orchard district of New York State and in the apple markets of New York City, Buffalo, Chicago, Milwaukee, Detroit, St. Paul, Kansas City, St. Louis, and Louisville.

In the height of the season an investigation of the movement of cold-storage apples was initiated, and this investigation extended throughout the entire season, with the monthly publication of information regarding the marketing of storage apples.

This bulletin, therefore, is not a comprehensive treatment of the subject of apple marketing, but rather is a report of such investigations as the Office could carry on in its present stage of development.

NOTE.—This bulletin is of general interest to apple growers, shippers, dealers, transportation companies, and consumers, and to all engaged in the trade in apples and fruits.

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CONDITIONS PRECEDING THE MOVEMENT OF THE CROP.

A study of the commercial crop conditions throughout the summer of 1914 revealed the fact that the country would produce one of the largest apple crops in its history. Information in this respect was secured by the Office from special correspondents in the commercial orchard districts. Remembering that the total production far exceeds the market surplus, especial distinction was made in gathering the information. It is generally thought that the market surplus or the commercial crop ranges between 40 and 50 per cent of the total production in ordinary years. The results of investigations conducted by the Bureau of Crop Estimates indicate that 41 per cent of the 1913 apple crop and 38 per cent of the 1914 crop were "shipped out of counties where grown." [1] Formerly the estimates of the Department had been made in terms of percentages. However, in compliance with a demand for such information, the Bureau of Crop Estimates issued in terms of bushels its first quantitative report in August, 1914. The information published was secured from the Bureau's crop correspondents located throughout the United States, and related to total production only.

EFFECT OF THE WAR UPON EXPORT PROSPECTS.

With the opening of the European war it was not thought that the United Kingdom and the Continent would draw their usual supply of American apples, and a severe decrease in export demand appeared to be so imminent that the Office of Markets and Rural Organization issued a warning to growers and shippers, advising them to be exceedingly cautious about shipping apples to seaboard for export, unless steamer space and a certain demand on the other side were assured. The general trade forecasts gave the impression that the European markets were not to be counted on seriously as offering an outlet for a large amount of apples. In the past the influence of English and continental markets upon conditions at home have been strong, although the quantity of fruit shipped is not large as compared with the market surplus, and when it appeared that the European outlet would be closed a serious depression ensued.

EFFECT OF THE WAR UPON THE HOME MARKETS.

The most serious effect of the war upon the business conditions which preceded the movement of the crop and which followed throughout the marketing period was a contraction of credits in the United States and a resultant lack of confidence on the part of the trade. The South, which consumes a large quantity of apples, was especially restricted in credits, owing to the condition of the cotton

[1] Farmers' Bulletin 672, p. 6.

market. Combined with the prospects for a very large crop of apples these business conditions created directly or indirectly by the war caused a depression in opening values; but really, as may be shown later, this depression may have been very beneficial for the reason that the market opened on a low level, thereby creating an unusual consumptive demand for the fall and winter months.

The results of the investigations that preceded the movement of the crop were published in the Agricultural Outlook of September 16.[1] In that connection, practical suggestions were made for the proper handling of the crop, including a general forecast of market prospects.

CONDITIONS IN THE NEW YORK STATE ORCHARD DISTRICT.

One of the investigators visited the orchard district of New York State. This section had suffered from excessive rains, with the result that the Greening crop had been badly damaged by a fungus and it was feared that the Baldwin crop would suffer likewise. Speculators and operators were paying the farmers at this time for such varieties as Greening, Baldwin, Spy, etc., $1.35 to $1.50 per barrel f. o. b. loading station. This was for New York A grade (2½-inch minimum) fruit, packed and branded in compliance with the New York State law. The B grade (2 to 2¼ inch minimum) of these same varieties were bringing $1 to $1.25 f. o. b. loading station. For King, farmers were receiving $1.75 to $2 per barrel for A grade fruit, and $1.50 for B grade. These prices were for barreled apples f. o. b. cars or delivered to the storage houses.

The following estimates were given as the expense incurred in picking, grading, packing, and marketing a barrel of apples: The standard apple barrels cost 40 cents each; pickers received 15 cents per barrel of loose, unpressed, ungraded fruit. It cost 10 cents per barrel, piecework, for grading and packing, and 5 to 10 cents for hauling from the orchard to the loading station or storage warehouses, the total expense being 70 to 75 cents per barrel.[2]

As a result of the defects caused by rainy weather and also because of the grower's fear of not being able to pack according to the New York law, large quantities of fruit were being sold to buyers who shipped it in bulk to the consuming markets. Growers were being paid 50 cents per hundredweight for this fruit delivered on the car. Most of the buyers specified that the fruit be 2 inches minimum in transverse diameter. Many cars, however, contained ungraded fruit, and much worthless stock was sent to market. The marketing of fruit in this manner would have been thoroughly good business had the inferior portion been left at home. In many cases such stock

[1] Farmers' Bulletin No. 620, pp. 15–16.

[2] Bulletin 130, U. S. Department of Agriculture "Operating costs of a New York apple orchard," gives comprehensive information regarding the cost of preparing barreled apples for market.

had to be discarded at destination and as a result the returns from the sale of the merchantable grades were reduced materially by the cost of shipping and handling the unmerchantable fruit. It can not be said that the consumer paid more for good apples, because the wholesale buyers as a rule discount sufficiently the price paid to the farmer so that all costs and other losses for handling this character of mixed stock will be met.

The operation of the New York standard package and grade law was noted especially, and information regarding its results will be found on page 13.

STUDIES IN THE MARKETS.

TRACING DISTRIBUTION.

The mediums through which apples usually pass in the large markets are the wholesaler, jobber, and retailer. In the case of consignments, the sales are usually made by the commission merchants to the jobbers. Frequently a wholesaler, commission merchant, or jobber performs the functions of all three, so that there is no distinct line which apples may be said to take in process of city distribution.

Growers east of the Rocky Mountains form market contacts in many ways. Frequently the original sale is made at the orchard to local or itinerant buyers, who sell to large operators or city dealers. The brokers in the producing areas and in the market centers do a large business as salesmen or purchasing agents for all those engaged in the distribution to retailers. Such are the usual steps when the growers act individually. Collectively or cooperatively short cuts are possible, because through organization all the growers of a community may make direct market contacts with the city dealers.

In those markets where investigations were carried on an effort was made to trace the distribution of specific lots of apples through to the consumers in order to observe the various steps and ascertain the cost of handling, including trade margins. It proved very difficult, however, in most cases, to trace the whole of any original shipment through to its final sale to the consumer, and the larger the city the more difficult the tracing.

It is easy to trace wholesale lots from the shipper to the wholesaler, but just as soon as the lot is broken up the record of its disposition becomes more difficult to obtain. The wholesaler may sell to the jobber or to the retailer or perhaps direct to some large consumer. He will probably have a record of the sale to a jobber, but many of his sales to retailers are likely to be in small quantities, for cash, and without record of the purchaser. The jobber, in turn, may sell either to a retailer or to a large consumer, and a very large part of his sales are likely to be for cash, without further record. It is possible, therefore, to follow only a small part of the shipment even so far

as the retail dealers. Further, a considerable part of the retail business is handled by hucksters, from whom it is difficult to get much satisfactory information with regard to sales and expenses, even if it were possible to find out from the wholesaler or the jobber what particular hucksters had purchased the apples that were being traced. And, in addition to the lack of records on the part of the dealers, the problem is often complicated by the fact that in some cities half a dozen nationalities may be represented in those receiving parts of a single original shipment. This is especially true in New York City.

RETAIL METHODS AND COSTS.

In studying the various phases of city apple marketing, special attention was given to retail methods and costs. The purpose of this study was chiefly to learn whether the wholesale supply controls the price. The cost of operation as a factor in determining retail prices also was investigated as far as possible.

Retail apple distributors may be classed as follows:

(*a*) Fruit-stand vendors.

(*b*) Fancy grocers, fruiterers, etc., catering almost exclusively to high-class or fashionable trade and doing a verv extensive credit business.

(*c*) Grocers catering to a cheaper class of trade, largely upon a cash basis.

(*d*) Hucksters or street peddlers.

Relatively high prices were charged for apples purchased at fruit stands. Extra fancy Northwestern and Colorado Jonathans were sold to the dealers during October and November at prices ranging from $1 to $1.25 per box. Apples which grade 150 to the box retailed at 2 for 5 cents, or $3.75 per box. This meant a gross profit of about 250 per cent. In the 96 size, extra fancy Jonathans sold at 3 for 10 cents, or $3.20 per box, showing a gross profit of about 200 per cent.

In the East Side tenement section of New York City it was learned that by reason of the cheap prices prevailing and the heavy supply of apples arriving the peddlers were operating to the detriment of fruit stands. The fruit-stand dealers were selling only about one-third to one-half the quantity of fruit handled in former seasons. The pushcart and wagon peddlers as a rule buy packed or loose fruit cheap and go direct to the homes of the residents, selling at prices considerably below the fruit-stand men. The peddlers handle a large quantity, make quick cash sales, and pay no rents. Other dealers incur heavy operating expenses and generally sell not for the purpose of moving a large quantity, but for the highest price obtainable. Consequently, the movement is restricted.

The largest profits were found usually in barreled apples. For instance, New York B grade, 2 inches minimum, approximately 600 apples to the barrel, sold for a cent each or $6 per barrel. These apples cost the retail dealer not over $2 per barrel delivered to his store, allowance being made for jobber's profit and drayage. The investigator saw "A grade" fruit, 2½ inches minimum, averaging about 400 apples per barrel, which cost the retailer not over $3, being displayed for sale at 2 for 5 cents, or $11.25 per barrel. Such prices prevailed at no less than 25 retail stores visited in one day. Apples were being offered for sale at retail all over New York City at prices ranging from 1 cent each at the cheap corner fruit stands, to 50 cents and 80 cents per dozen at the fanciest fruit stores.

In general, it may be said that the gross profits of fruit-stand vendors range from 100 to 250 per cent. Operating expenses other than rent in most cities except New York are not relatively high and all sales are on a strictly cash basis; hence the net profits on good fruit are large.

Grocers catering to high-class trade buy only the best apples. Extra fancy Jonathans, Grimes, etc., preferably 138's and 150's size, were purchased at $1 to $1.25 per box. These apples were taken from the box and repacked in small splint trays similar to the peach basket used in a six-basket carrier. Each box of apples filled approximately 10 trays. Each tray sold for 30 cents; hence the box brought $3, representing a gross profit of about $1.75. Extra fancy Delicious and Winter Banana, 72's size, purchased at $2 per box, retailed at 5 cents each, or $3.60 per box. Other sizes and varieties brought corresponding prices. No attempt was made by this class of grocers to stimulate consumption by temporarily reducing prices.

The retail prices quoted above were maintained consistently throughout the 1914 season, regardless of prevailing jobbing prices. The large margins charged by the retailers, for the most part, were due apparently to the small amount of business handled, the perishable nature of the commodity, and the cost of operation.

An elaborate and efficient delivery service must be maintained by the grocers, and many small deliveries are made each day at an actual loss to the dealer. A large proportion of the grocery-store patrons buy on credit and pay when it becomes convenient. Many of these accounts are never paid. Hence it becomes apparent that the good customer who pays his bill regularly each week, or who pays cash, must suffer for the shortcomings of others. However, there can be little doubt that reducing prices would materially increase consumption and in the end result in equally good profits for the retailer. Reduced prices and better business practice should prove to be very beneficial to grower, dealer, and consumer.

The profits derived from the sale of cheaper grades of apples to the poorer class of consumers are not so large. It was learned that those catering to such trade operated on a margin of 75 to 100 per cent of the purchase price. Table 1 shows the purchase and selling prices of certain varieties of apples handled by retail grocers in St. Louis, Mo., on October 13 and 14, 1914.

TABLE 1.—*Purchase and selling prices of apples handled by retail grocers in St. Louis, October 13 and 14, 1914.*

Variety.	Purchase price per barrel.	Selling price, per peck,[1] received by 10 retail grocers.									
		No. 1.	No. 2.	No. 3.	No. 4.	No. 5.	No. 6.	No. 7.	No. 8.	No. 9.	No. 10.
		Cts.	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*
Ben Davis	$1.55 to $1.75	25	.....	.....	25	25	.....	30	30	.....	.....
York Imperial	2.25 to 3.00	35	.....	.....	.....	.....	.....	40	40	.....	.....
Jonathan	[2] 1.00 to 1.25	40	.....	.....	.....	40	50	.....	.....	.....	40
Spy	2.75 to 3.00	.....	40	.....	.....	.....	.....	.....	.....	.....	.....
Gano	1.65 to 1.80	.....	.....	25	50	25	.....	.....	.....	.....	.....
Rome Beauty	1.65 to 2.60	.....	.....	30	.....	40	.....	.....	.....	.....	.....
Hubbertson	1.75 to 2.50	.....	.....	.....	35	.....	.....	.....	.....	.....	.....
Missouri Pippin	1.30 to 1.65	.....	.....	.....	.....	.....	.....	.....	.....	15	.....
Greening	2.00 to 2.15	.....	.....	.....	.....	.....	.....	.....	.....	.....	25–50

[1] Grocers secure 12 to 13 pecks from a barrel of apples; 4 pecks from a box of apples.
[2] Per box.

By keeping prices at a rather high level, the stores move only a small quantity each day. Considering the fact that overhead and operating charges are not so high as in the case given above, and that there is a greater proportion of strictly cash trade, it appears that the margin of profit is rather great. It is reasonable to believe that sales could be made on a very much closer margin and still offer ample protection and profit to the dealer. These grocers, however, seem to prefer handling small quantities rather than moving large quantities upon small margins.

The peddler and pushcart men truly may be called distributors. These dealers are large factors in creating a demand for fruit. They make an effort to find customers and by so doing dispose of a large quantity. As a rule, they handle only the poorer grades, buying extra fancy and fancy boxed apples only when the price is extremely low. This year they handled more box apples than ever before, and the margins were small. The circumstances under which they work enable them to make a close price, and it seems certain that any reduction they could afford to make would not affect materially the rate of consumption. In general, it appeared that retail apple prices were too high this year, and there is little doubt that the amount used would be increased greatly if grocers would buy in larger quantities and sell at a price sufficiently low to attract public attention.

In a middle western market there is a chain of retail stores which handle apples in a very original manner. They sell for cash, make no

deliveries, and have no telephones in their stores. Their plan is to sell a peck of apples proportionately as cheap as they could sell a barrel. The concern publishes a weekly newspaper which in one week had a circulation of 26,000 copies. In this paper they advertised the commodities on which they would make special prices. On November 4, 1914, they quoted "Excellent cooking apples," which cost them about 10 cents, at 15 cents per peck. This company moved a large quantity of fruit through their various stores at low prices, made a profit of about 50 to 60 cents a barrel, and enabled the consumer to buy far below the usual retail prices.

The investigator also secured the record of sale of 118 barrels of apples through 5 and 10 cent stores. The complete distribution of this lot from grower to consumer is given in Table 2.

It will be noted that the 5 and 10 cent stores handled this fruit for 21.8 per cent of the consumer's dollar. A large Pacific coast growers' organization, in its efforts to secure a record of the distribution of the orange consumer's dollar, secured reports covering the market prices of oranges for a whole year. When these reports were tabulated it was found that 33⅓ per cent of the orange consumer's dollar remained with the retailer. So it would appear that through distribution conducted as in the case given above a saving of 11.53 per cent can be effected, it being granted that apples and oranges are retailed in a similar way.

TABLE 2.—*Distribution of the consumer's dollar in a sale of 118 barrels of apples distributed through medium of 5 and 10 cent stores.*

	Retail costs per barrel.	Per cent of consumer's dollar.
Grower received (on the tree)	$1.455	38.49
Cost of barrel, picking, grading, packing, and hauling	.66	17.46
Fruit growers' association selling charges	.135	3.57
Freight, origin to destination	.416	11.00
Cartage at destination (depot to store)	.05	1.31
Loss (shrinkage) to wholesaler	.032	.84
Cost to wholesaler	2.748	
Wholesaler's profit	.208	5.53
Cost to 5 and 10 cent stores	2.956	
Profit to 5 and 10 cent stores	.824	21.80
Price paid by consumer	3.78	100.00

For distribution and costs this lot of fruit was marketed very satisfactorily, but of course the case is not typical of retail handling. It is interesting to note that the distribution was from a growers' association through wholesaler and retailer to consumer. In the large cities the jobber usually intervenes between the wholesaler and retailer, while wasteful methods and costly service come between the retailer and consumer, with the result that prices are charged which may be prohibitive of heavy consumption.

MARKET PREFERENCES FOR VARIETIES.

It can be truly said that most markets can always find use for a good quality apple, no matter what its shape or the color of its skin may be. It is probably unreasonable to say that one market will take only certain varieties while another will take other varieties. Conditions are always changing preferences. For instance, due to low prices, there was a noticeably increased demand in some cities, known as barreled-apple markets, for box-packed fruit. The certainty of securing uniformly sized, highly finished fruit at extremely low prices was the only reason given for this condition.

To illustrate how a market takes a new apple, it may be stated that on October 27 two cars of extra fancy northwestern boxed fruit of little-known variety sold to the retail trade at 75 to 85 cents in one of the markets. Three days later apples of the same grade, pack, and variety were selling well at $1.25 because they had become better known. It must be said, however, that markets do not usually exhibit such quick action in taking up new varieties of fruit. A new variety must have exceptional merit to cause a market to act as quickly as in the above case.

GRADES—BOXED, BARRELED, BULK.

As has been mentioned previously in this publication under "Market preferences," some cities are known as boxed-apple markets and some as barreled-apple markets. Other cities or sections are known as good markets in which to dispose of bulk apples.

Every community, be it known as a boxed, barreled, or bulk apple market, has different classes of consumers who demand different classes of fruit. In New York City, for instance, there were received from various apple-producing sections from October 19 to November 21, 1914, 1,882 carloads of barreled apples, 383 carloads of boxed apples, and 443 carloads of bulk apples, or a total of 2,708 carloads of apples for a period of 28 business days. It can not be stated, however, that this proportion would apply in New York City throughout similar apple seasons.

Table 3 gives the number of carloads of barreled, boxed, and bulk apples received in New York, Chicago, Detroit, and St. Paul for the periods shown, and also the percentages of each class of fruit used by each market. It shows, in addition, the totals for all four markets, and the average percentage of barreled, boxed, and bulk fruit handled jointly by all four markets. Thus it will be noted that the barrel-packed fruit predominates by over 50 per cent.

TABLE 3.—*Number of carloads of barreled, boxed, and bulk apples received in cities named.*

City.	From—	To—	Number of business days.	Carlot receipts.						Total.	
				Barreled apples.		Boxed apples.		Bulk apples.			
				Cars.	Per cent.	Cars.	Per cent.	Cars.	Per cent.	Cars.	Per cent.
New York	Oct. 19	Nov. 21	28	1,882	69.5	383	14.15	443	16.35	2,708	100
Chicago	Sept. 15	Dec. 5	70	1,683	41.96	900	22.44	1,428	35.60	4,011	100
Detroit	Nov. 2	Nov. 30	24	140	53.23	8	3.04	115	43.73	263	100
St. Paul	Oct. 16	Nov. 17	27	318	60.46	99	18.82	109	20.72	526	100
Totals and averages				4,023	53.58	1,390	18.52	2,095	27.90	7,508	100

Detroit was receiving such heavy supplies of bulk fruit from the Michigan orchards, and it was selling so cheaply, that western and northwestern growers were practically unable to make any sales in that market. It will be noted that 8 cars of box-packed apples were all that Detroit handled. New York received an average of 96 carloads of all classes per day. It must be remembered, however, that New York is a large export market. All of these apples came direct to the New York terminals, part going into immediate consumption, part into cold storage, and part being exported. In most cases the fruit exported from the port of New York, however, was billed direct, origin to destination via New York City, and these cars were not recorded as having been received by the local freight offices.

It was interesting to note that the boxed fruit this season went to all classes in New York City, rich and poor alike, while in normal seasons only the rich and moderately well-to-do middle classes could afford to purchase such fruit. This condition existed also in other markets, and the extremely low price at which boxed fruit sold this year was the cause of this condition. Well-graded and highly-colored barreled fruit also reached this same class of trade. Low grades of barreled fruit and all bulk apples went to the pie men and the poorest people.

Knowledge of the requirements, customs, and changing conditions of the markets is most important in selling apples. The growers can acquire this knowledge best through efficient cooperative organizations, with capable sales managers in charge.

THE EFFECT OF INFERIOR APPLES UPON THE MARKET.

An effort was made in some of the markets visited to study the movement of low-grade apples and the general effect of such movement on the apple market in general. Judging from observations

made from September 15 to December 5, inclusive, and the statements of large apple dealers, the investigator in the Chicago market found that approximately 25 per cent of car-lot bulk arrivals, equivalent to about 350 carloads, and 10 per cent of the contents in barreled shipments, equivalent to about 160 carloads, or a total of about 510 carloads of the apples received, were so poor in grade and quality that they would not have brought freight charges had this kind of fruit been received in straight carload quantities.

Those farmers shipping apples to Chicago that season would have saved the cost of their barrels and the packing, loading, and part of freight charges had they eliminated the poor fruit. They also would have relieved their market, thereby giving the good stocks an opportunity to net a reasonable and profitable return.

Similar conditions were found to obtain in Louisville, Ky., where a large portion of the bulk apples received were bruised and covered with mud or otherwise soiled, showing that the fruit either had been blown off the trees or else had been shaken off by the grower. Such apples also showed decay.

In one instance the commission merchant to whom was shipped a car of inferior York Imperial apples, which arrived at Louisville about November 16, 1914, wired the shipper that he could not handle them advantageously, and the consignment was delivered to another dealer. The apples were sold "for grower's account' at 40 cents per 100 pounds. The railroad waybill indicated a total weight of 19,000 pounds, and the statement of sales is as follows:

Gross sales, 19,000 pounds, at 40 cents per hundredweight		$76.00
Freight	$52.00	
Commission for selling, at 10 per cent	7.60	
Total charges		59.60
Net proceeds		16.40

It is seen that this sale netted the grower just $0.0863 per hundredweight, an amount which barely paid the cost of assembling the fruit for shipment. Moreover, the purchaser of the car lost about 25 barrels on account of decay.

Plate I shows the contents of one barrel of apples inspected and regraded by the investigator in New York. The fruit was supposed to be strictly No. 1 grade, 2½ inches minimum in transverse diameter. The larger pile, representing about two-thirds of the barrel, were true to grade. The smaller pile contained culls. The investigator had no trouble in finding this barrel of apples, and could have found others just as poorly graded. The condition of the original pack indicated ignorance, carelessness, or "sharp practice" on the part of the packer.

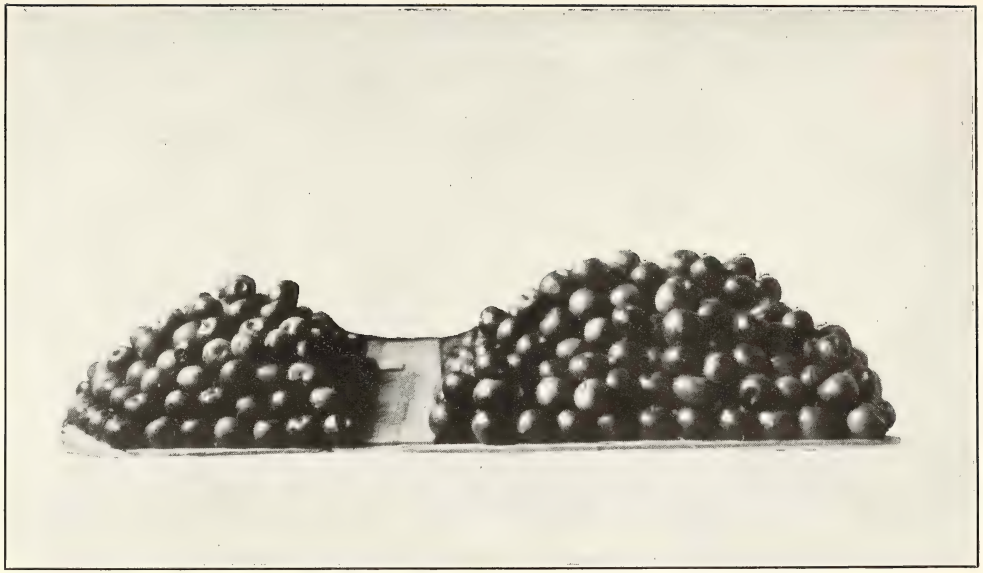
SHIPMENTS UNDER VENTILATION AND REFRIGERATION.

Some cars of apples inspected in the markets visited showed softness and decay. It was thought this was due to lack of refrigeration, poor ventilation, or poor grading of the fruit itself before being packed and loaded on the cars.

Of the three classes of fruit (boxed, barreled, and bulk) consigned to the markets, the box-packed apples usually arrive in the best condition. This class of fruit is usually well graded and tightly packed, thus giving assurance of its carrying well. The principal fault found with box-packed apples (especially the Jonathan variety) during the 1914–15 season was that a large percentage of the shipments arrived in overripe condition. At first it was thought that this may have been due to shipping this variety without refrigeration during the warm weather of the early fall months in order to save refrigeration costs. It was learned, however, that weather conditions and failure of the grower to gather the fruit at the proper time caused the Jonathan's to be overripe at time of shipping. While refrigeration may have retarded the deterioration, still it was a question if the extra cost would have been justified, so in most cases such fruit was rushed in ventilators to the nearest markets. Under the conditions no power could have delivered this fruit in good condition and the results secured were only to be expected.

Coming to markets already heavily supplied with first-class fruit and of necessity being destined for prompt consumption on account of their condition, these apples sold for prices slightly below the market for stock with keeping qualities. Dealers who ordinarily would have paid fair prices feared to do so in direct competition with good, firm stock. On the Kansas City market alone it was learned that approximately 20 cars of boxed apples from the Northwest were sacrificed on account of arriving in ripe condition. It is thought that these apples sold at a discount of approximately 25 cents per box, for, although they were in fair condition for immediate consumption, they had no storage value.

It is desirable for the growers to realize that no expenditure for refrigeration or cold storage can compensate for failure to pick and pack at the proper time. The refrigeration of overripe apples will not restore them to a sound condition nor prevent their progressive deterioration either in transit, in storage, or in the market. On the whole, there was noticeable a great improvement in all barreled stock arriving. The regulatory law of New York State caused the growers and packers to grade more closely and to display their names on the heads of the barrels. Thus poor, wormy, fungous, or scabby fruit, that formerly went to market in barrels, generally was kept at home.



A BARREL OF APPLES REGRADED IN NEW YORK BY INVESTIGATOR—ONE-THIRD CULLS.

Great improvement could have been made in shipping bulk fruit. A number of cars arrived in bad condition, due principally to two causes. First, large quantities of undersized, wormy, bruised, and otherwise defective fruit were shipped in heavily loaded cars and decayed easily when subjected to the heat generated in fresh vegetable products placed in bulk. Furthermore, bulk fruit was shipped frequently in ordinary box cars. It was impossible properly to ventilate the fruit in these cars, although attempts were made in some cases to slat the doorways, thus allowing a slight circulation of air. Some shippers used foresight and good judgment in ordering ventilators far in advance of shipment, but it is impossible to secure this equipment at all times when the movement of fruit products is heavy.

Many consignments of properly picked and graded bulk fruit arrived in very poor condition, because they were loaded in improperly constructed cars. Other consignments of bulk fruit, having been shipped under proper conditions, arrived at the markets in such good shape that the owners packed the fruit in barrels and placed it in cold storage.

In some cities the transportation companies provided for the fruit a minimum of protection from the weather. After a few days of continuous rain in St. Louis, Mo., the investigator of this office visited the levee, where thousands of barrels had been stacked three tiers high. It was noted that the commission men had attempted to protect the barrels with tarpaulins, but this was insufficient. The coverings failed to cover all of the barrels, and those at the bottom of the stacks were thoroughly soaked also as the water ran down the levee. These barrels immediately swelled, the hoops split, and the heads and staves bulged. The fruit depreciated 25 cents or more per barrel on account of poor terminal facilities.

GRADE AND PACKAGE LAWS.

In New York State the effect of the apple grade and package law was studied. The law is mandatory and provides for four grades—"Fancy," "A grade," "B grade," and "Unclassified." Very few growers packed the "Fancy grade," because they thought its specifications too strict, and owing to the large crop and scarcity of labor there was a tendency to pack those grades which could be prepared most easily.

The first year's operation of this statute resulted in a marked improvement in the marketing of the apple crop of the State, and it is generally conceded that it has been very beneficial. It established confidence at a time when confidence was sorely needed. Its grades for the most part proved to be a common language between the

shippers and receivers, sales being made readily and adjustments of difficulties more easily effected upon the basis of its standards. It may be said that the New York growers strived to comply with the law. Many, fearing that they could not do so, marketed their crops in bulk during the fall, and much inferior stock was kept at home, thus leaving the market to the better grades.

The New York State law differs from the Federal apple grade and package law, commonly known as the Sulzer law, which is not mandatory. Some packers who may have failed to comply with or who did not desire to grade by the New York State law have attempted to take advantage of the conflict between the two laws. The New York State law does not prevent compliance with the Sulzer but imposes additional requirements as to grading. It frequently occurred in case of condemnation by the State inspectors that the packers erased the New York markings and substituted brands allowed by the Federal law.

With the enactment of grade and package laws in other Commonwealths, there are likely to be many conflicts between the laws of the States and between State and National laws. The advisability of uniformity in legislation along these lines is apparent. Maine and Vermont now have individual laws providing for standard grades and packages for apples, and legislation is pending at present in Massachusetts, New Hampshire, and Connecticut. These laws are all very similar, and it is believed the fruit interests of the various sections will cooperate in securing as great uniformity as possible. Utah, Oregon, Washington, Montana, and Idaho have laws fixing the standard box and providing for the elimination of wormy fruit, but the grades are not specified. These laws are believed to have rendered an excellent service in improving the general quality of fruit grown in the sections affected.

COLD-STORAGE HOLDINGS AND MOVEMENT.

Reports emanating from unofficial sources indicated that sufficient cold-storage space was not available in the fall of 1914 for conserving the supply of apples for distribution throughout the winter and spring, and it is claimed that large quantities of apples wasted in the orchards for lack of storage facilities.

Cold-storage owners must fill their space for as much of the year as possible. Eggs, butter, and other commodities are sources of revenue during the summer and early fall, especially in the markets, but these commodities generally give place sufficiently by the first of October to provide for the apple crop. During the past season, however, the egg market was very inactive, and stocks cleared very slowly. Space for apples, therefore, was in great demand, and many storages would quote only a season rate, whether the fruit was to be stored for a long

or short term. There is no indication that the rates were increased; on the other hand, in western New York the storage firms reduced the usual 50-cent charge to 40 cents on account of the low prices which were being paid for apples.

Until the past season accurate information regarding the quantity of apples placed in cold storage and the progress of the movement during the winter and spring has not been available to the public. In October the Office of Markets and Rural Organization undertook to secure and publish the data, so that growers and dealers alike might direct the sale of their holdings in an intelligent manner.

The cooperation of the cold storages was solicited for this purpose, and a large number assisted in making the office reports valuable. However, many concerns failed to answer the inquiries which were sent to them at the end of each month, and many submitted only partial reports, some reporting one month and failing to do so the next. The holdings of such firms necessarily were eliminated from consideration in estimating the progress of the movement, for the reason that a comparison between the holdings from month to month with the holdings on December 1 is necessary for determining the movement.

The office mailing list now includes the names of 667 cold-storage firms. Of these, 443, with a capacity of 8,902,013 barrels, have reported their holdings one or more times during the season. The balance, or 224 concerns, failed to reply at all. It was not possible, therefore, to publish quantitative reports showing the total number of barrels and boxes held. Still, the number of firms which responded was thought to be sufficiently large to justify the issuance of percentage reports through the medium of the press. This was done monthly, and a detailed report of each investigation was printed in the current number of the Agricultural Outlook and mailed to the cold storages, trade papers, and individual growers and dealers. These investigations embraced the holdings of apples not only during the season of 1914–15, but also of 1912–13. The crops of the two years were similar, and it was thought that a comparison of the holdings would be helpful to growers and dealers in arriving at true values.

Estimating upon the basis of the reports received, it was found that the holdings on December 1, 1914, amounted approximately to 11½ per cent more than those of December 1, 1912; on January 1, 1915, 23 per cent more than January 1, 1913; on February 1, 1915, 28.4 per cent more than February 1, 1913; on March 1, 1915, 5.7 per cent less than March 1, 1913; on April 1, 1915, 15.6 per cent less than April 1, 1913; on May 1, 1915, 13.2 per cent less than May 1, 1913.

Of the total number of storages reporting, it was found that 289 responded December 1; 306, January 1; 280, February 1; 289, March 1; 270, April 1; and 258 on May 1. While the minimum number of

storages reporting for any one month was 258, still only 179 firms reported uniformly for each month. Estimates for the monthly movement for the entire season, therefore, are based upon this number. Table 4 shows the monthly movement from these 179 plants in terms of percentages:

TABLE 4.—*Monthly movement of apples from 179 cold storages reporting—estimated on the basis of their total holdings December 1, 1914.*

Month.	Per cent of barrels.	Per cent of boxes.	Per cent of total holdings.
December	11.1	5.7	9.7
January	20.1	12.3	18.1
February	20.5	26.2	21.9
March	24.5	26.3	25.0
April	14.5	15.6	14.8

There remained in storage on May 1 approximately 10 per cent of all apples held in the coolers on December 1, if the conditions existing in these plants may be accepted as a criterion of the general situation. It is interesting to note that the market supply of apples as indicated by the 179 plants on May 1 was 13.2 per cent less than May 1, 1913, whereas the crop of last year was much in excess of two years ago.

It would appear, then, despite the war and depressed conditions here, that the actual movement of apples from cold storage has been very satisfactory in comparison with 1912–13. It is thought that the liberal consumption of this fruit was due to the uniformly low prices which prevailed in the early fall and throughout the entire year. In February, however, the situation looked especially grave, for the reports of February 1 indicated unusually large holdings. In publishing the data secured at that time the office issued a timely warning [1] to growers and dealers advising them that a regular, vigorous movement would be required to prevent disaster in the spring. Fortunately for trade in apples, the late spring prevented heavy shipments of first southern vegetables and made conditions excellent for the handling of apples, so that holdings rapidly diminished.

PACIFIC NORTHWEST APPLES VIA THE PANAMA CANAL.

Reports of four shipments of boxed apples made during the past season from the Pacific Northwest via the Panama Canal to New York City for export were secured. These shipments, which were made in December, January, and February, consisted of 54 cars and represented practically the entire quantity forwarded through the canal. With the exception of 8 carlots, all of this fruit arrived in New York in first-class condition. These 8 carlots, which represented the total

[1] Farmers' Bulletin 651, p. 10.

shipment upon one of the steamers, showed overripe condition and slight decay, supposedly as the result of poor refrigeration conditions.

All of these Panama shipments were sent across the Atlantic. Although no cold-storage space was available on board the trans-Atlantic lines, practically all of the fruit, with the exception of 8 carlots previously mentioned, was said to have shown excellent condition and sold for relatively good prices in the European markets.

The water freight rate from the Northwest ports via the Panama route to Brooklyn is 55 cents per hundred pounds, whereas the railroad rate is $1 per hundred pounds. It is to be remembered, however, that the Panama route is available only to those fruit districts which are near the Pacific coast, and that when wharfage, dockage, and inland freight are included there is a relatively small saving even for those districts.

It is estimated that the saving to Hood River on shipments via Panama is 16 cents per box for apples which would have gone in railway ventilators and 27 cents per box for refrigerators. The saving to Yakima and Wenatchee is from 8 to 10 cents on ventilator stock and 18 to 20 cents on refrigerator stock. Owing to the long time (approximately 37 days) required for shipment through the canal as compared with shipment by rail and the resultant risks, it is thought that the actual saving per box is inconsiderable, and that for this route to be largely profitable to Pacific Northwest shippers the rate of transportation must be lowered and trans-Atlantic cold-storage space must be available upon arrival at New York City.

As far as physical handling is concerned, it is believed that the canal route has been proven entirely practicable, although its use upon the basis of present rates necessarily must be confined to shipping points near the Pacific coast and to markets on the Atlantic seaboard or beyond. Apples coming through the canal at present can not be distributed profitably inland from the Atlantic coast, for when terminal and inland charges are added this route can not compete with the transcontinental railways.

EXPORT MARKETS.

THE UNITED KINGDOM AND EUROPE.

It has been stated that prior to the shipping season of 1914 it was generally believed, under the war conditions, that Europe could not be expected to demand its usual quota of apples; consequently there was much speculation as to what would be done with the export surplus. When the crop of winter varieties began to move, shippers cautiously forwarded considerable quantities to England. Although sales were not high, the low level of prices obtaining in the United States justified continued shipments across the Atlantic.

The cheapness of the fruit invited heavy consumption, with the result that the movement increased rapidly until the quantities forwarded not only exceeded all expectations, but proved to be little short of the largest export years. The United States was favored for the reason that steamers plying between Canadian and English ports were requisitioned for transport purposes, thus placing limitations upon the exportation of apples from the Dominion.

Direct dealing with Hamburg, Germany, had increased rapidly in recent years, but this outlet into the German Empire was closed so effectually that not a single package of American apples has been forwarded direct to that port. On the other hand, the Scandinavian markets, which formerly received their supplies through English and German channels, have taken large quantities direct. This should prove to be of real benefit in future years, for the reason that when direct dealing is once established it is likely to continue.

The following statement of total export shipments from the United States and Canada during the past five years is given for purposes of comparison:

TABLE 5.—*Total export shipment of apples from United States and Canada.*

Fiscal year.	From the United States for fiscal years ending June 30.	From Canada for fiscal years ending Mar. 31.	Total.
	Barrels.	*Barrels.*	*Barrels.*
1910–11	1,721,106	523,658	2,244,764
1911–12	1,456,381	1,664,165	3,120,546
1912–13	2,150,132	1,324,769	3,474,901
1913–14	1,506,569	947,382	2,453,951
1914–15	[1] 1,846,224	1,117,336	2,963,560

[1] Official report not yet available. Number given is reported by New York forwarding agents as representing shipments from New York, Boston, and Portland.

SOUTH AMERICA.

American shippers have made a special effort to develop markets for apples south of the Equator. Direct trade with South America may be said to have begun five years ago. Prior to that time supplies had been secured principally from England and Australia, apples from the United States frequently going to these markets through the hands of English dealers. Direct sales to South American markets were small in the first year, and they were made subject to acceptance upon arrival, the shipper paying all freight and insurance charges and collecting through the medium of English banks by sight draft attached to the documents.

The shipments from New York direct to South America increased approximately 400 per cent in the first four years after direct trade began. No consignments were attempted without previous sale

until the fall of 1913, when an exporter shipped 13,000 boxes to Buenos Aires via New York and, a little later, 9,000 boxes via the Straits of Magellan.

An early opportunity was secured to dispose of the 22,000 boxes at a profit of about 40 cents a box, but a large proportion of the consignment was held too long, resulting in a loss to the shipper on the transaction as a whole. The same shipper, however, is now preparing for further shipments to South America early in the coming season, for the handling of which arrangements have already been made.

During the past year a New York firm of distributors sent a representative to study the South American markets and make trade connections for direct handling. This firm formerly had sold apples and other products to New York exporters.

The representative spent two months in South America, but met with considerable difficulty in interesting the importers, who, it appeared, were very well pleased with their trade connections in the United States. Contracts for the sale of approximately 9,000 boxes for fall delivery were secured eventually, and agents appointed in Buenos Aires. Sales were arranged upon easy terms, but when deliveries were made only 1,600 boxes were accepted, the balance of the shipment being sold by the commission agent. Thereafter regular consignments to this market were made for the purpose of supplying the demand independently of the importers who formerly had controlled the handling of this commodity. Much of the fruit has been sold at auction, circulars being previously distributed among small dealers, hotels, restaurants, etc. On March 3, 1915, 5,000 boxes of apples were sold in this manner.

It is not known just what the future results of these experiments may be. It is thought by those who have had the longest experience with South American importers that these markets can be developed best by handling the business in a manner most acceptable to the dealers. Attention is called to the fact that the importers have been accustomed to supply their markets by placing orders judiciously and receiving only such stock as has been bought previously. The consignment of apples, therefore, is severely discouraged by them, and it would appear from the experience of the past two years that those shippers who have endeavored to secure this trade by overstepping Latin customs have not been entirely successful in their ventures.

It is understood that formerly the margins of gross profits have been very large. Owing to the risks involved, it is only to be expected that this business could not be handled upon margins that might prevail in the United States or between the United States and

Europe. Apparently, American trade with markets below the Equator has been conducted with profit both to the American shipper and the South American importer. The consignment methods would seem to decrease the profits per package, and it is possible that this accounts for some of the opposition reported to have been encountered. It is too early to arrive at definite conclusions regarding the effect of these consignments upon future business.

At Buenos Aires, the chief market for this commodity, the cold-storage facilities are considered to be excellent and space for short-time storage costs from 1 to 1½ cents per box per day. Consignments to Brazil have not been attempted. A duty of $1 per box is imposed by the Brazilian Government, and this adds to the risk of shipping fruits unsold. The chief market is Rio Janeiro, but the trade of that city is considered to be somewhat controlled by one concern, which operates the only cold-storage plant. It has been reported that a Brazilian railway company with terminals at Rio Janeiro plans the erection of a competing storage. If this plan is executed it is thought the conditions in this market would be considerably improved for receiving and handling consignments of American apples.

The ocean freight and insurance amounts to $1.20 per box. The facilities for safe transportation have been greatly improved within the past two years, owing to an increase in the imporation of fresh meat from Argentina. Refrigeration is necessary for meat transportation, and the cold chambers are well suited to the transportation of apples on the return journey. If trade in meat products between South America and the United States continues to increase, the facilities for handling large quantities of apples are expected so to improve that space will be sufficiently available to justify lower rates. When the cost of transportation and the usual trade margins are combined, it will be seen that the selling price of apples in South America of necessity must prohibit heavy consumption. If transportation facilities can be improved so as to decrease the rates and the risk of deterioration in transit, it is believed that trade margins may be decreased reasonably and that the result in price to the consumer will be such as to encourage a large increase in shipments.

In order to assure the safe transportation of apples to South America it is necessary that the fruit be carefully selected, graded, and packed by hand, special care being exercised to eliminate everything that can not be classed as "Fancy" or "Extra fancy." The box package is preferred for the reason that the fruit arrives in much better condition than when packed in barrels. To illustrate the need of care in this respect, the experience of an eastern fruit growers' association may be given. Through its foreign agent the sale of several carloads was made to a South American importer at 12

shillings per barrel delivered on board the steamer at New York City. Delivery was made and the money collected, but the future patronage of the buyer and probably the prospect of future sales in his market apparently have been lost, because the fruit was not properly graded and packed at the time it was shipped from the producing area. An investigation has shown that this fruit had been packed without inspection on the part of the organization and that the packing was done some days in advance of shipment. Only a few barrels in each lot were inspected when the fruit was loaded on the cars.

Table 6 shows the direct shipments of apples in terms of barrels from New York to the respective South American markets within the past five calendar years. The values given were those entered upon the steamship manifests and were estimated either upon the basis of the New York market or upon the value at destination.

TABLE 6.—*Exports of apples from New York to South America, by countries, during the years 1910, 1911, 1912, 1913, and 1914.*

Country.	1910		1911		1912		1913		1914	
	Barrels.	Price.	Barrels.	Price.	Barrels.	Price.	Barrels.	Price.	Barrels.	Price.
Argentina	1,182	$4,340	8,464	$36,882	6,939	$37,511	36,513	$158,378	28,045	$194,358
Brazil	9,186	34,525	16,150	67,370	14,977	63,688	21,936	111,780	13,264	96,523
Chile			5	20						
Colombia	450	2,077	638	2,564	896	2,985	929	3,379	778	2,475
British Guiana	126	561	581	2,081	551	2,118	448	1,934	127	396
Dutch Guiana	260	1,138	273	1,137	203	750	187	763	104	327
French Guiana	3	12	7	26	9	33				
Uruguay	305	1,270	583	2,795	280	902	603	2,352	2,240	9,931
Venezuela	1,144	4,121	1,570	6,557	2,213	7,977	1,579	5,746	1,686	5,175
Total	12,656	48,044	28,271	119,432	26,068	115,964	62,195	284,332	46,244	309,185

CONCLUSION.

The information secured from the apple market investigations conducted by the office in 1914–15 would seem to warrant the following conclusions:

(1) That relatively low prices in large crop years in the beginning of the season make for quick movement and rapid consumption, with the natural result of better season averages.

(2) That the marketing of inferior grades along with good fruit in large crop years is not profitable.

(3) That the effective operation of grade and package laws may be counted upon to aid in stabilizing apple markets.

(4) That the general dissemination of accurate information regarding the holdings of apples in cold storage at stated periods tends to eliminate speculation by bringing about a more even distribution upon the basis of actual values.

(5) That the Panama Canal route may be an increasingly important factor in the distribution of apples grown along the Pacific seaboard.

(6) That the exports of apples during the season 1914–15 were large, despite the unsettled conditions caused by the war in Europe, and that a demand for American apples may be expected to continue.

(7) That apples from the United States are growing in favor with South America, and that by judicious cooperation with the Latin-American trade shipments may increase.

The studies conducted in the markets during the fall of 1914 indicated the need for more strict grading and careful handling, the elimination of culls from the fresh-fruit markets, more intelligent distribution, and the effective operation of cooperative associations. Often when the individual growers act independently in marketing the crops, there is little uniformity in the grading and packing, much poor fruit is shipped, much good fruit is forwarded in overripe condition, and the output of the community is dumped on the markets with little regard for equitable distribution or proper storage conservation.

Better methods are required for profitably marketing the increasingly large apple crop. These methods are provided best by effective cooperative organizations. In those States in which apples are packed in boxes, the growers' associations handle a very large percentage of the output. The quality of their fruit, the uniformity of the pack, and the distribution of the crop far surpass the individual results of the Middle West and East. Unusual difficulties were responsible for the development of cooperative associations in the Far West, and it is thought that the problems of the growers east of the Rocky Mountains are coming to be so great that dire need will require them to organize for the purpose of securing more profitable results.

APPENDIX.

The charts included in this Appendix show the daily carlot receipts of barreled, boxed, and bulk apples and the total receipts in the markets of St. Paul and New York City during selected periods in October and November, 1914. Charts 3 to 7 show the total receipts and wholesale prices per barrel of Greening and Baldwin apples in New York City during the 1909–10 season and subsequent seasons to date. Charts 8 to 12 give similar data for York Imperial and Ben Davis apples, in the same market.

DAILY CAR-LOT RECEIPTS OF BARRELED, BOXED AND BULK APPLES AND TOTAL RECEIPTS AND AVERAGE WHOLESALE PRICE IN ST. PAUL OCT. 17–NOV. 16, 1914

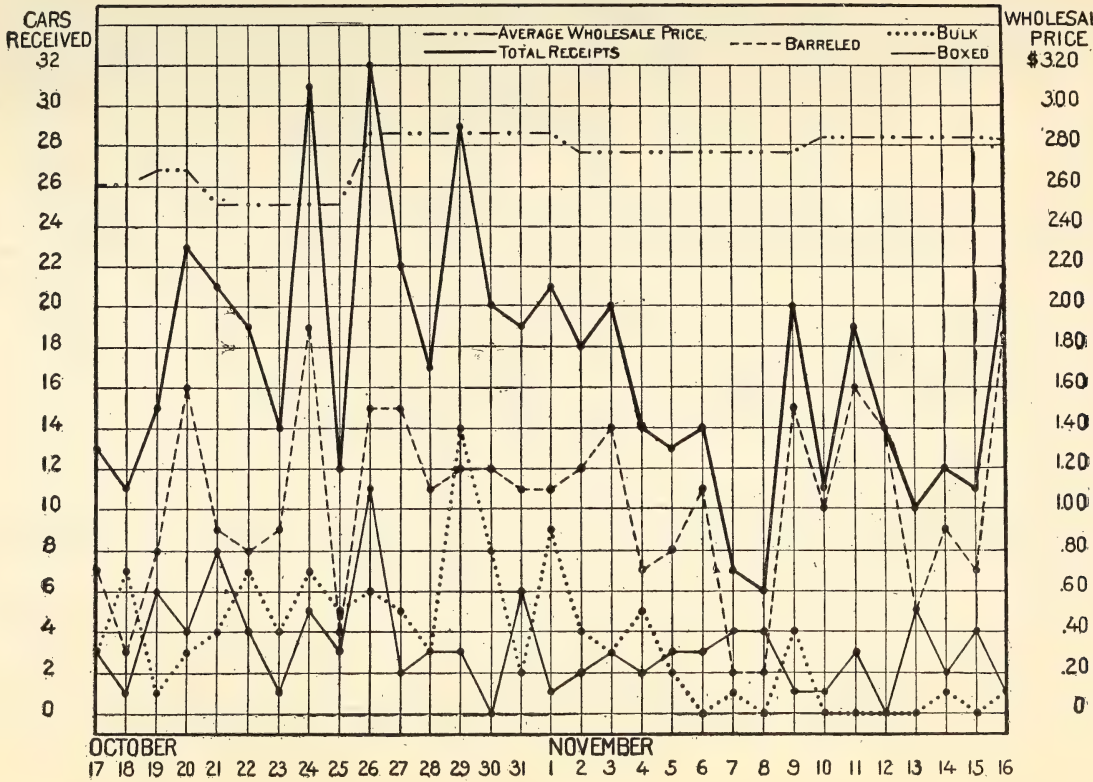
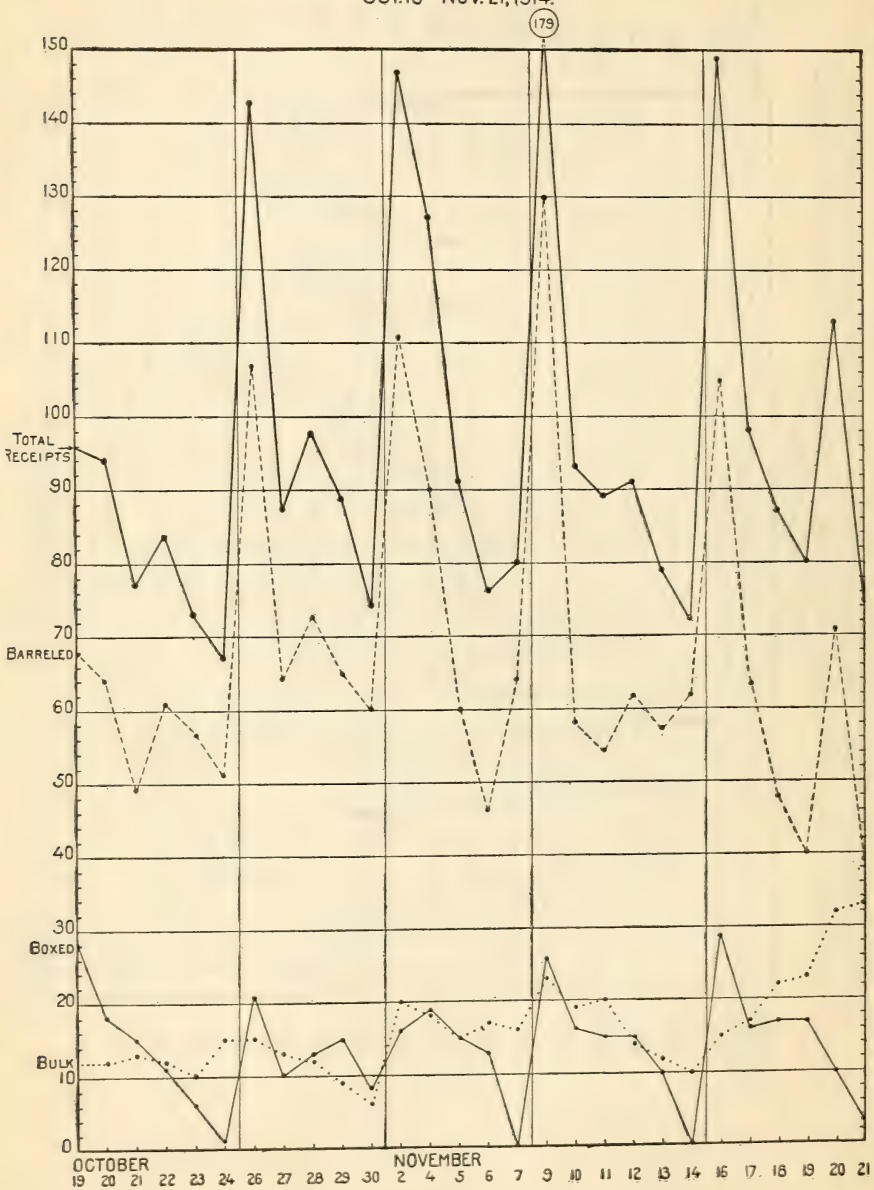


CHART 1.

DAILY CAR-LOT RECEIPTS OF BARRELED, BOXED AND BULK APPLES AND TOTAL RECEIPTS IN NEW YORK CITY OCT. 19 – NOV. 21, 1914.



RECEIPTS AND WHOLESALE PRICES PER BARREL IN NEW YORK CITY OF GREENING AND BALDWIN APPLES SEASON 1909—1910

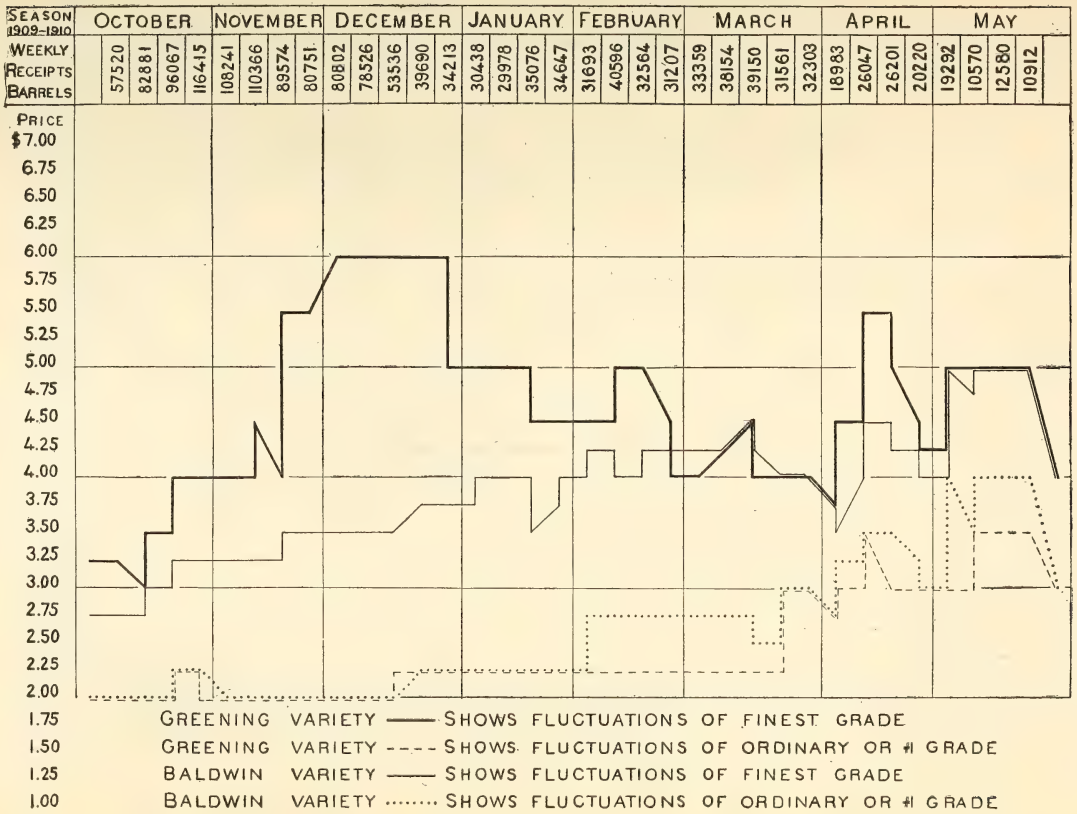
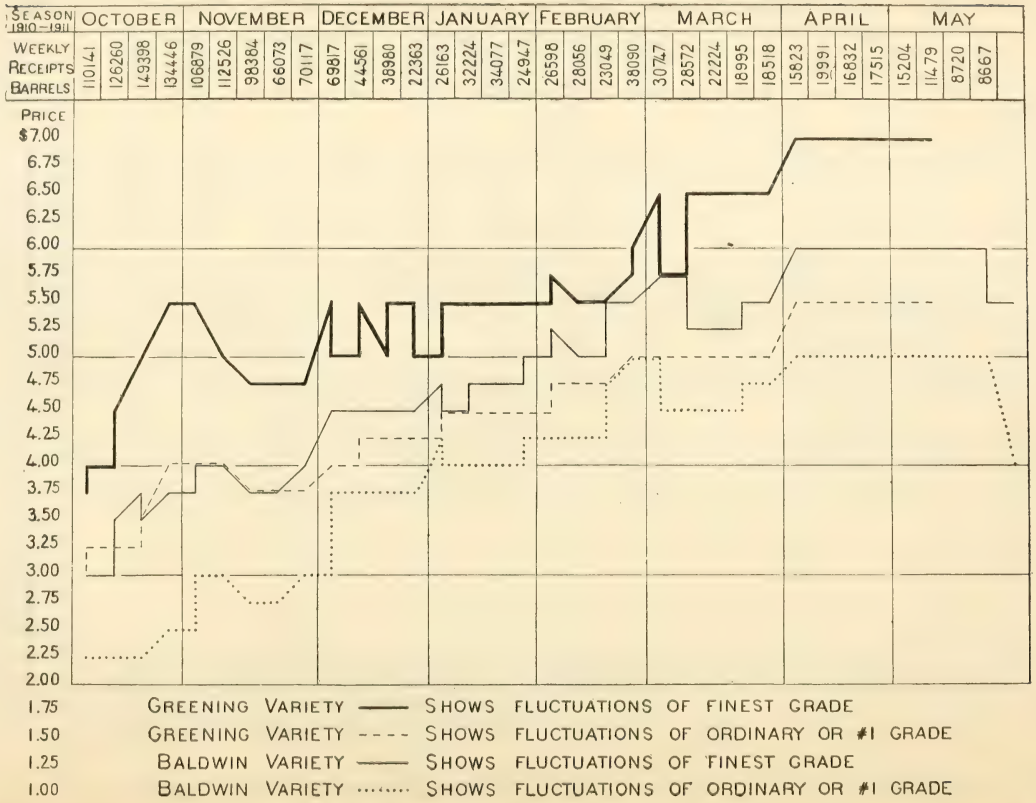


CHART 3.

RECEIPTS AND WHOLESALE PRICES PER BARREL IN NEW YORK CITY OF GREENING AND BALDWIN APPLES SEASON 1910—1911



Bul. 302, U. S. Dept. of Agriculture.

CHART 4.

RECEIPTS AND WHOLESALE PRICES PER BARREL IN NEW YORK CITY OF GREENING AND BALDWIN APPLES. SEASON 1911—1912.

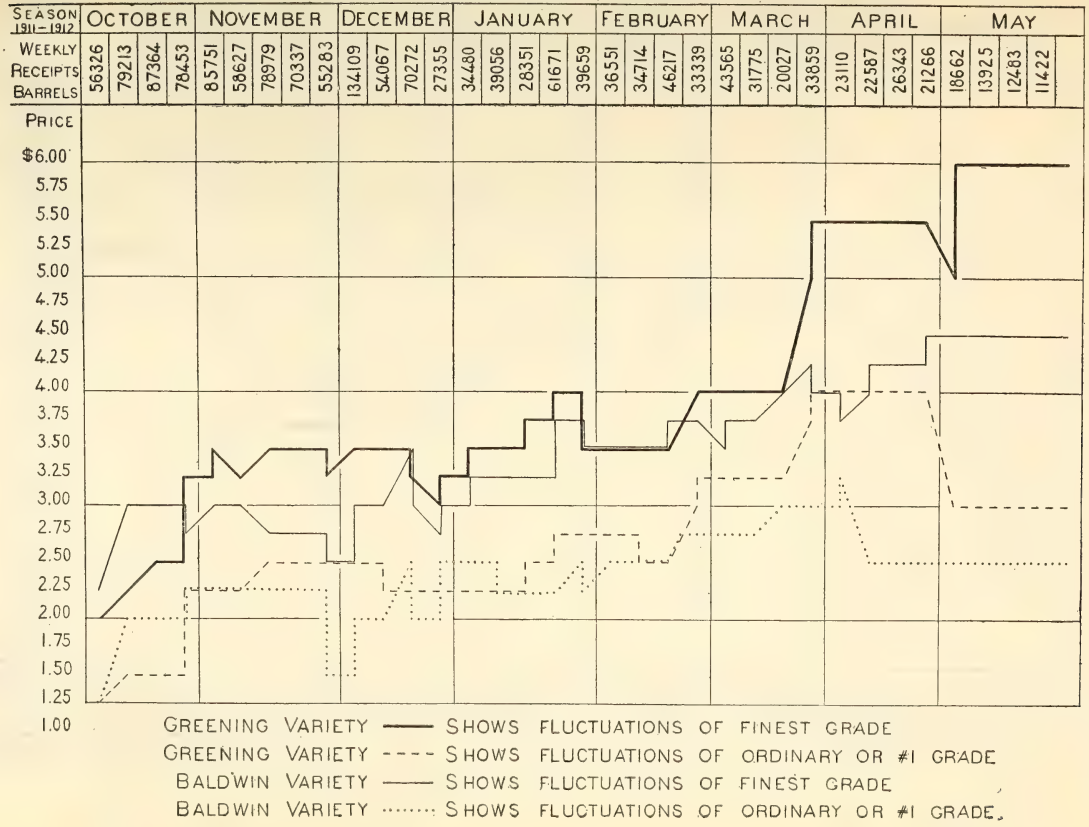
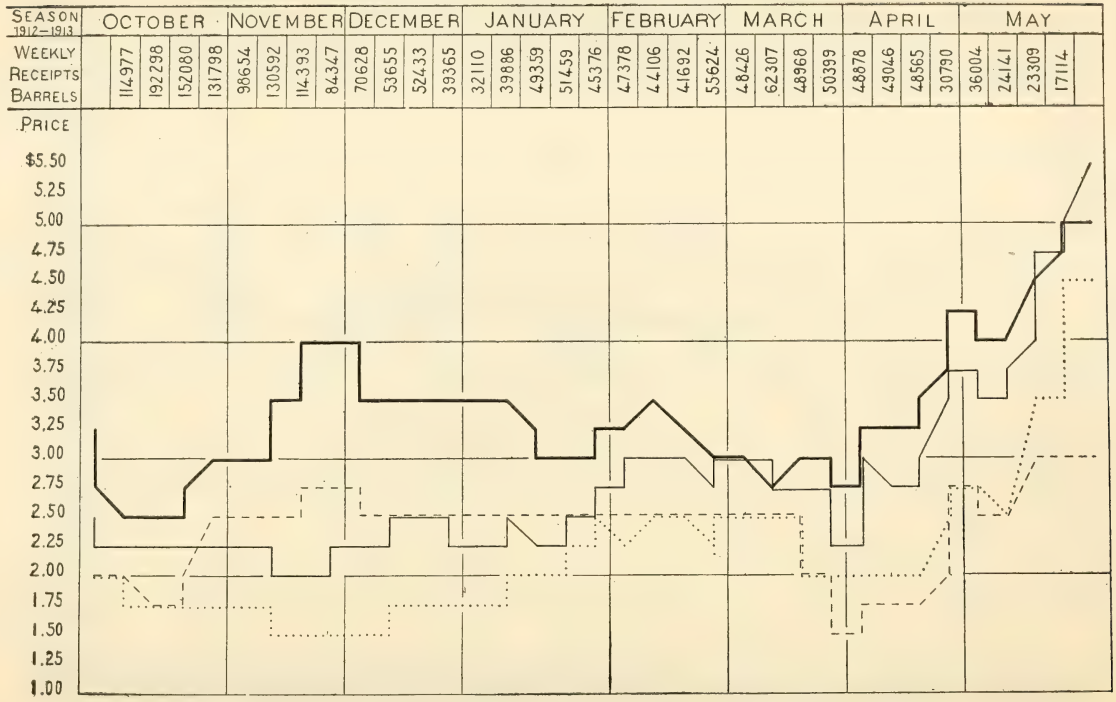


CHART 5.

Receipts and Wholesale Prices per Barrel in New York City of Greening and Baldwin Apples Season 1912—1913



Greening Variety —— Shows fluctuations of finest grade
Greening Variety - - - - Shows fluctuations of ordinary or #1 grade
Baldwin Variety —— Shows fluctuations of finest grade
Baldwin Variety ····· Shows fluctuations of ordinary or #1 grade

Chart 6.

RECEIPTS AND WHOLESALE PRICES PER BARREL IN NEW YORK CITY OF GREENING AND BALDWIN APPLES SEASON 1913—1914.

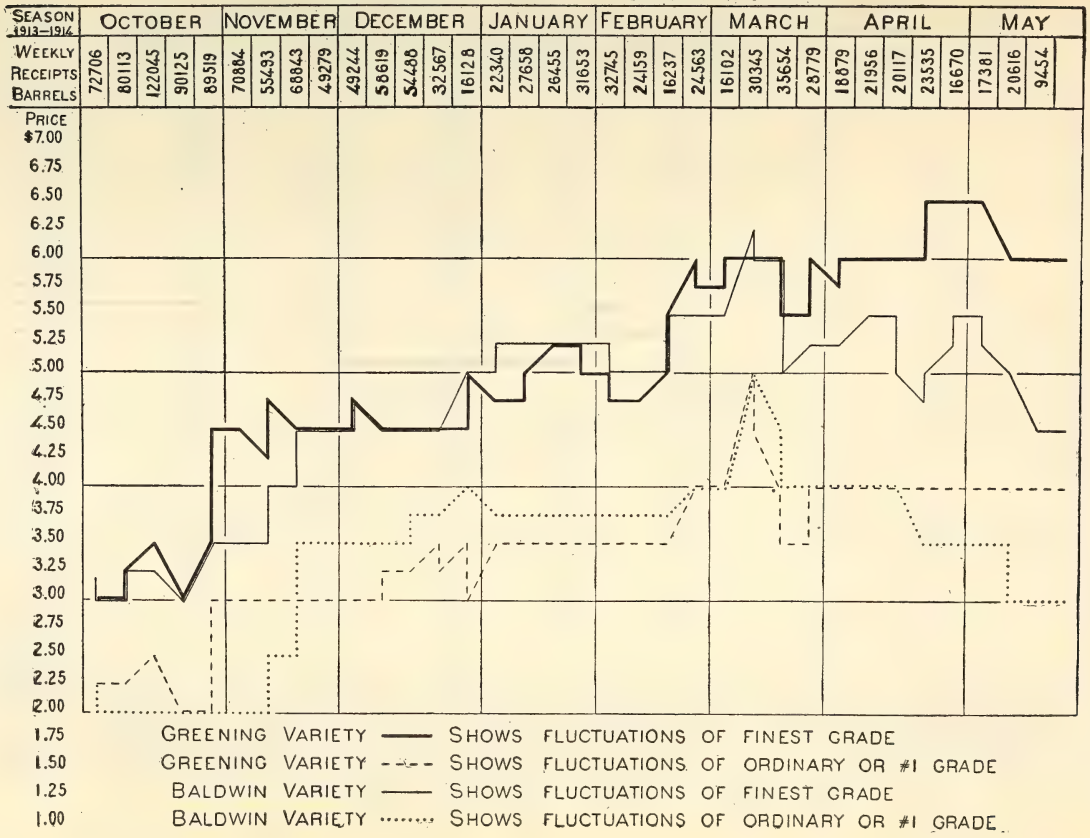


CHART 7.

RECEIPTS AND WHOLESALE PRICES PER BARREL IN NEW YORK CITY OF YORK IMPERIAL AND BEN DAVIS APPLES SEASON 1909—1910

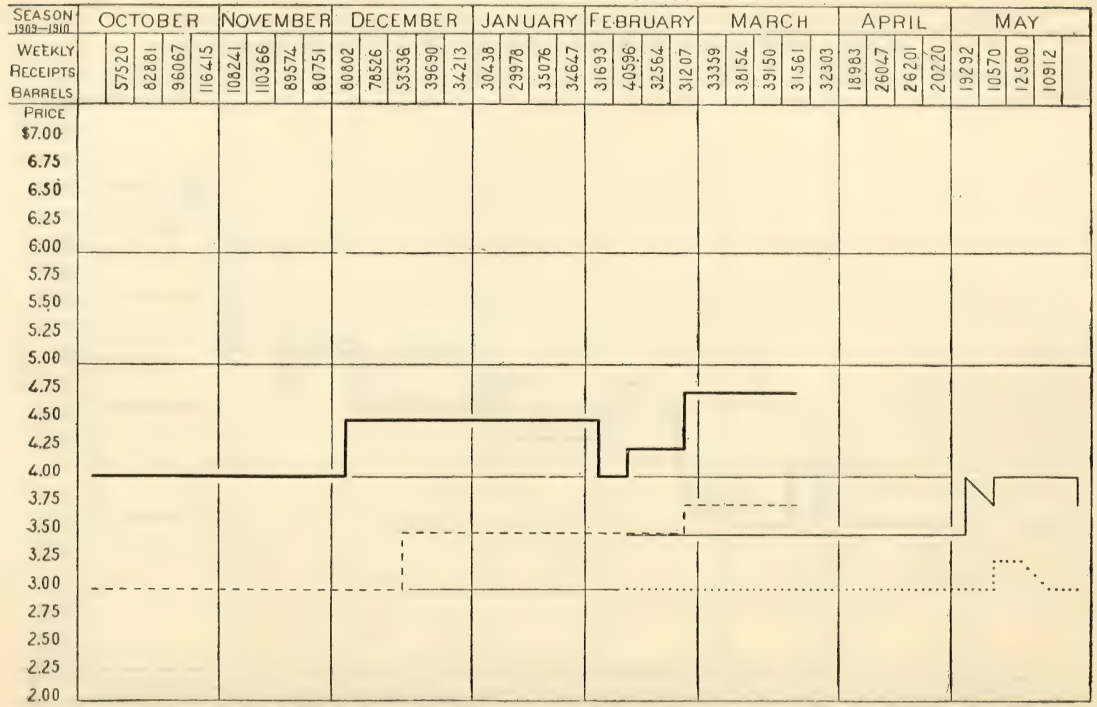
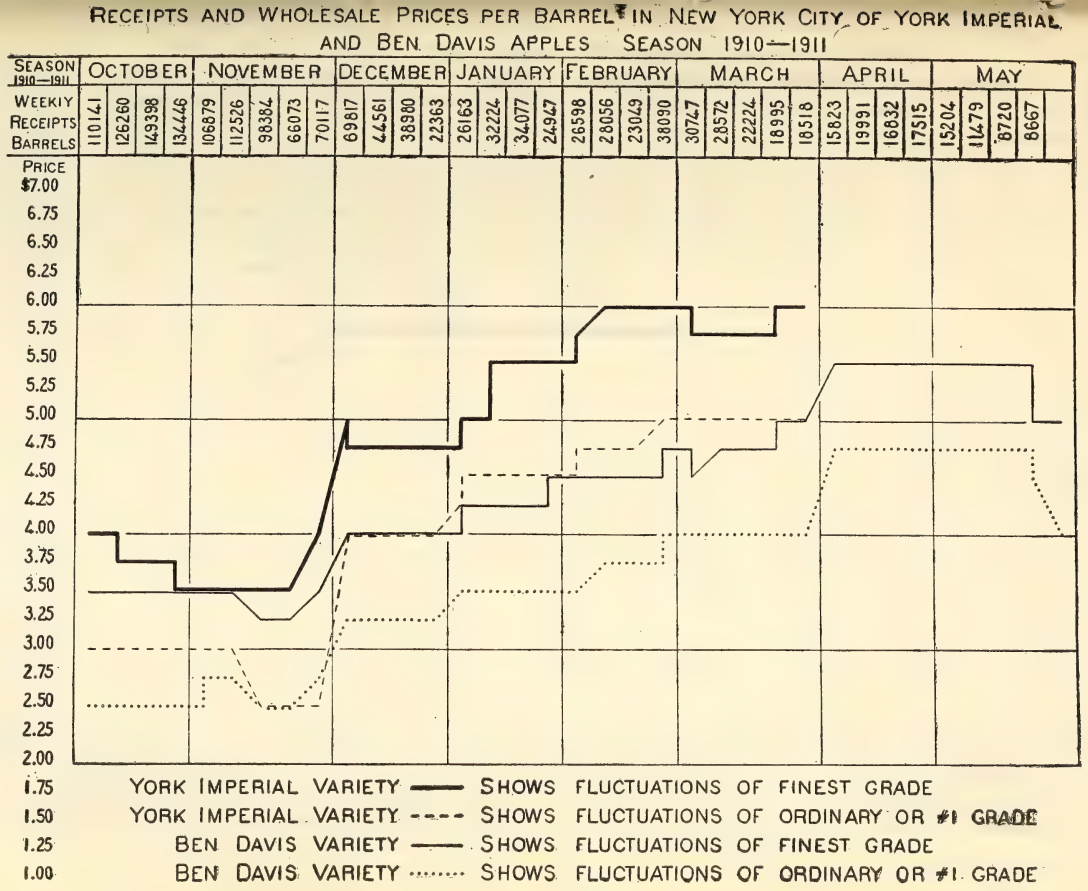


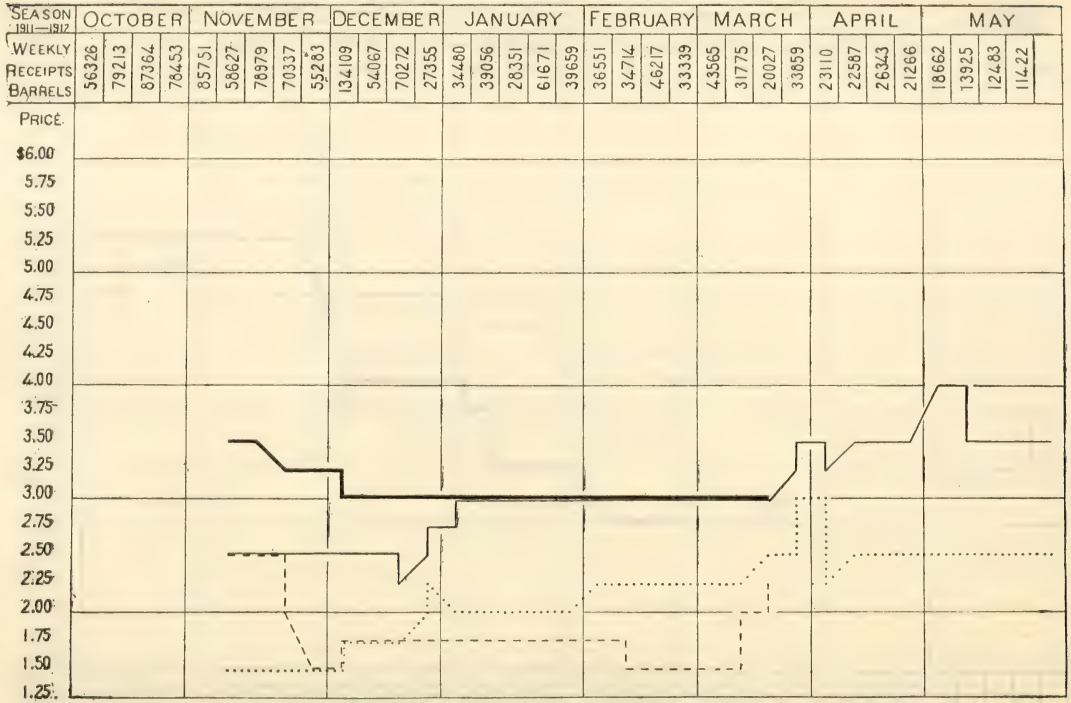
CHART 8.



Bul. 302, U. S. Dept. of Agriculture.

CHART 9.

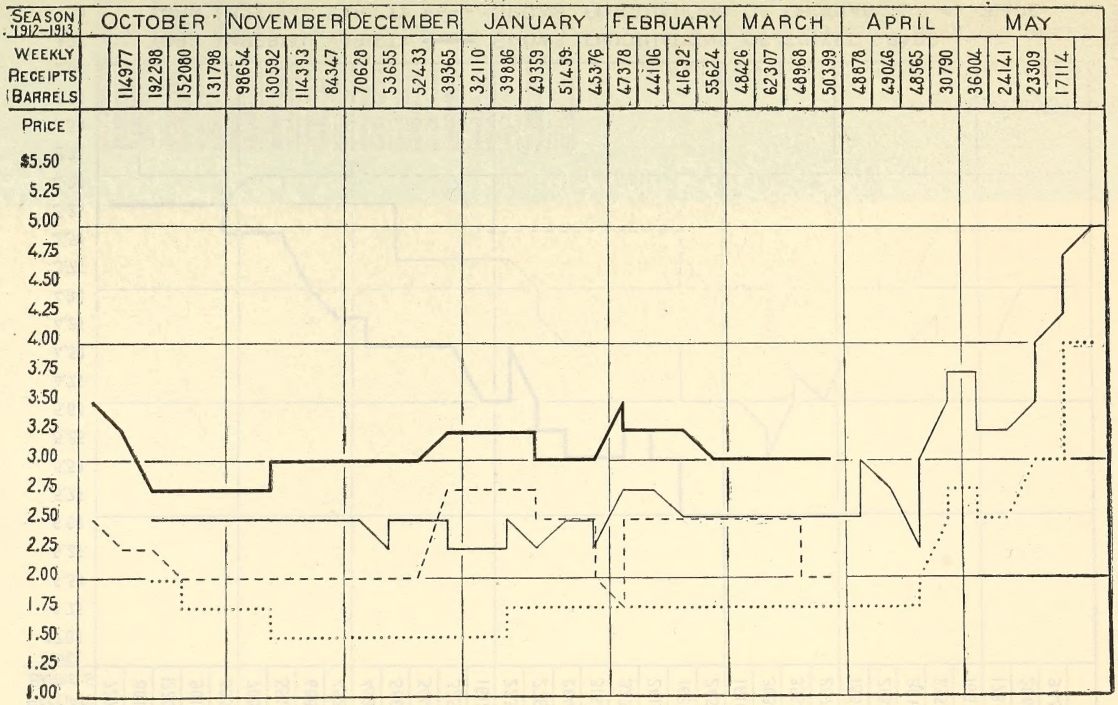
RECEIPTS AND WHOLESALE PRICES PER BARREL IN NEW YORK CITY OF YORK IMPERIAL AND BEN DAVIS APPLES SEASON 1911—1912



YORK IMPERIAL VARIETY —— SHOWS FLUCTUATIONS OF FINEST GRADE
YORK IMPERIAL VARIETY ---- SHOWS FLUCTUATIONS OF ORDINARY OR #1 GRADE
BEN DAVIS VARIETY —— SHOWS FLUCTUATIONS OF FINEST GRADE
BEN DAVIS VARIETY ..... SHOWS FLUCTUATIONS OF ORDINARY OR #1 GRADE

CHART 10.

RECEIPTS AND WHOLESALE PRICES PER BARREL IN NEW YORK CITY OF YORK IMPERIAL AND BEN DAVIS APPLES SEASON 1912—1913



YORK IMPERIAL VARIETY —— SHOWS FLUCTUATIONS OF FINEST GRADE
YORK IMPERIAL VARIETY - - - - SHOWS FLUCTUATIONS OF ORDINARY OR #1 GRADE
BEN DAVIS VARIETY —— SHOWS FLUCTUATIONS OF FINEST GRADE
BEN DAVIS VARIETY ..... SHOWS FLUCTUATIONS OF ORDINARY OR #1 GRADE

CHART 11.

RECEIPTS AND WHOLESALE PRICES PER BARREL IN NEW YORK CITY OF YORK IMPERIAL AND BEN DAVIS APPLES SEASON 1913—1914.

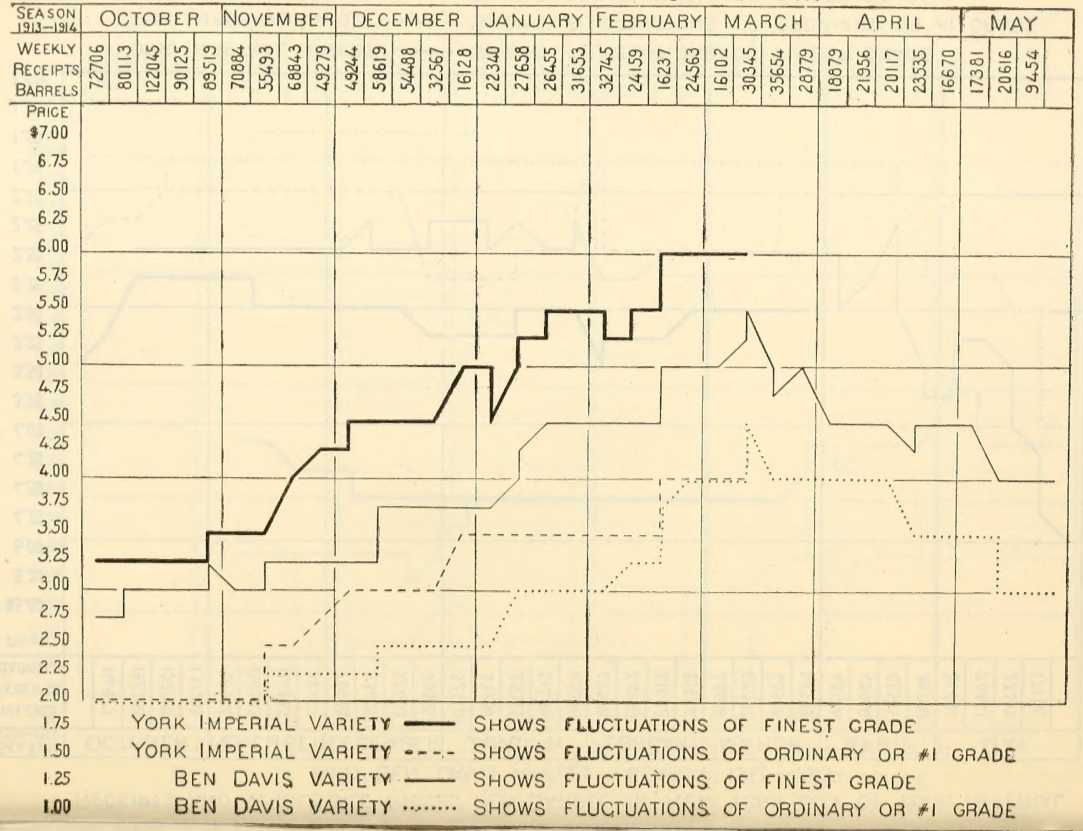


CHART 12.